

**II. REMARKS**

1. Claims 1 through 29 remain in the application.
2. Claims 1-7, 11, and 16 are patentable over the combination of Thornton (US 5,847,336) in view of Stanek (US 5,936,554).
  - 2.1. The combination of Thornton and Stanek fails to disclose light sources that are semiconductor light emitting devices made of layered foil structures, as recited by claims 1 and 16.

The present Office Action correctly points out that Thornton fails to disclose devices made of layered foil structures. Stanek also fails to disclose or suggest such devices. Because neither reference discloses light emitting devices, the cited combination cannot disclose or suggest all the features of the invention as claimed.

Applicants respectfully submit that semiconductor light emitting devices made of layered foil structures are not obvious at all when considering the cited art. Applicants submit that the conclusion of obviousness in this case is based on impermissible hindsight because it requires knowledge gleaned only from Applicants disclosure. There has been no reference cited that discloses semiconductor light emitting devices made of layered foil structures used in the same way as the present invention.

Applicants disagree with the Examiner's argument that it would have been obvious to substitute a conventional LED for an OLED because they perform the same function. Nevertheless, replacing the layered foil structure devices of the present invention with the conventional LED's of Thornton clearly yields a keypad that has no light emitting devices with layered foil structures.

Thus, the combination and arguments presented by the Examiner not only fail to include all the features of the claimed invention, but explicitly exclude the claimed feature of layered foil structures. Therefore, the cited combination cannot render the present invention unpatentable.

Thornton illustrates a conventional technical solution for key illumination using separate light sources (LEDs) for each individual key. The layered foil structure of the present invention is not even implicitly disclosed, in fact, Thornton provides teachings to the contrary by specifying individual LEDs.

Thornton is based on mid 1990's mobile phone illumination technology that typically included 15-20 LEDs for keypad area illumination, where each LED typically consumed approximately 20 mA of current. This type of power consumption is no longer feasible in today's environment where power consumption requirements are very low.

Stanek also has no disclosure related to light sources made of layered foil structures. Stanek only discloses PC computer keyboards with illumination mechanics and a structure strictly tied to LEDs. Stanek's PC's have a stable and strong power source, the fixed power line from the electric network and therefore have no requirement for reduced power consumption.

In contrast, the present invention teaches an implementation solution utilizing key illumination principles for improving usability and for providing some additional functionality to be used with non-standard applications, such as games.

Applicants disagree with the Examiner's argument that it would have been obvious to include a means to effect such illumination controls for the reasons stated in column 8 of Stanek. Column 8 includes the statement common to nearly every patent application, that the scope of the patent is not limited to the disclosed examples, but can be used with many "changes and modifications," and may include "other manners of key illumination" without departing from the scope of the claims. Regardless, the combination of Stanek and Thornton fails to disclose or suggest all the claim limitations of the present invention and therefore does not render claims 1 and 16 obvious.

The present invention provides a beneficial cost efficient technical solution for mobile phone keypad functionality that advantageously supports mass manufacturing, low power consumption, thin phone structures, and easy configuration for key illumination. Moreover, the illumination is not necessarily tied to or associated with keys, individual keys, or a display. Additional effects may be provided for games and animation sequences.

The Applicants have realized the advantageous use of layered foil structures for portable device keypad illumination, which provides additional flexibility for implementing functions and device operations. The improved functionality of the portable device and keypad is not dependent on keys or a display but is related to layered foil structures.

For these reasons, the combination of Thornton and Stanek fails to disclose or suggest all the features of claims 1 and 16.

2.2. In addition to failing to disclose or suggest all the limitations of the claims, the combination of Thornton and

Stanek fails to render claims 1-7, 11, and 16 unpatentable for at least the following reasons:

2.2.1. The technical arts are too remote or different

Thornton relates to illumination of a keypad explicitly using separate LEDs for each key. Thornton illustrates a conventional technical solution for key illumination using separate LEDs for each individual key.

OLEDs are known but are technically far removed from the cited references as such. Furthermore, none of the references disclose or suggest utilizing OLEDs with a mobile phone keypad. The suggestions of such a relationship is completely missing from the cited art.

Stanek relates to PC computer keyboards.

Thus, there are three separate and different technical fields of art present. However, they are too remote from each other, have no binding technical features, and have completely different disclosures, all of which preclude their combination. The skilled person would not look other references when starting from any of the cited references.

2.2.2. There is no reasonable expectation of success when combining the references.

There are inherent incompatibilities with the features essential to the present invention:

- The PC keyboard of Stanek does not fit a mobile phone because it is simply too big.

- The PC computer of Stanek has no relation to a mobile phone.
- The mobile phone is portable, quite small and light, and has a wireless connection. The only similarity with a PC may be the wireless connection.
- Thornton's LED based keypad structure is inappropriate for using OLEDs because the design the structure of the keypad mechanics shown in Figures 4, 6, 3 and 1 of Thornton is incompatible with OLED based layer structures. The LED (18) of Thornton is not replaceable with OLED technology. This would require significant modification of the keypad mechanics, and the instructions are missing, that is, there is no disclosure regarding how this would be accomplished.
- Thornton's LED based keypad illumination and mechanics cannot be integrated with OLED technology to achieve "a layer including a switching function and layered foil illumination structure for each of the plurality of keys, integrated together" as in the present invention. Thornton's disclosure and the subject of OLED technology relate to two separate fields of endeavor. Such a combination would require significant modification of the keypad mechanics of Thornton, and there is no disclosure or suggestion of how to accomplish this. A combination utilizing Stanek's PC keyboard is out of the question because the keyboard is absolutely too large to substitute for the keypad of Thornton.

2.2.3. The skilled person would not be motivated to make the combination.

As mentioned above, Thornton's disclosure and the subject of OLEDs relate to two separate fields of endeavor. Such a combination would require significant modification of the keypad mechanics of Thornton, and there is no disclosure or suggestion of how to accomplish this. A combination utilizing Stanek's PC keyboard is out of the question because the keyboard is absolutely too large to substitute for the keypad of Thornton.

Thus, Thornton presents no incentive or motivation for the skilled person to replace the LED's with anything else. To the contrary, Thornton's teachings are tightly related to solutions based on individual LED's and related keypad mechanics. These facts actually reduce or negate any motivation to utilize OLEDs.

There is no disclosure in Stanek related to replacing LEDs with a layered structure. The last sentence of column 8 tries to vaguely broaden the means for key illumination but even that portion of Stanek fails to disclose why or how to make the layered structure and mobile phone combination. The sentence in column 8, line 65-66 that "[h]owever, the invention [of Stanek] could utilize other manners of key illumination without departing from the scope of the claims" cannot represent such an incentive or motivation without additional information.

Thus, Stanek fails to provide any incentive or motivation for a skilled person to replace the LED with anything else. Neither does it give instruction as to why nor how to replace the keyboard of the PC. To the contrary, the teachings of Stanek are tightly related to the individual LED based solution and PC keyboard mechanics of the structures disclosed therein. The disclosure of Stanek serves to teach away from any combination that includes OLEDs.

For these reasons, a skilled person would find no motivation or suggestion to combine Thornton and Stanek to arrive at the present invention.

At least for these reasons, Applicants respectfully submit that claims 1-7, 11, and 16 are patentable over the combination of Thornton and Stanek.

3. Claims 8 and 9 are patentable over the combination of Thornton, Stanek, and JP 11-126047.

Claims 8 and 9 depend from claim 1.

Like Thornton and Stanek, JP 11-126047 fails to disclose or suggest light sources that are semiconductor light emitting devices made of layered foil structures for dynamically illuminating individual keys or key groups of a keypad in such a way that the illumination means is reconfigurable for different kinds of illumination effects, as recited by claim 1.

4. Claim 10 is patentable over the combination of Thornton, Stanek, JP 11-126047, and JP 11-327509.

Claim 10 depends from claim 1.

Like the other cited references, JP 11-327509 fails to disclose or suggest light sources that are semiconductor light emitting devices made of layered foil structures for dynamically illuminating individual keys or key groups of a keypad in such a way that the illumination means is reconfigurable for different kinds of illumination effects, as recited by claim 1.

5. Claims 12-15 are patentable over the combination of Thornton, Stanek, and JP 08-148056.

Claims 12-15 depend from claim 1.

The combination of Thornton, Stanek, and JP 08-148056 fails to disclose or suggest light sources that are semiconductor light emitting devices made of layered foil structures for dynamically illuminating individual keys or key groups of a keypad in such a way that the illumination means is reconfigurable for different kinds of illumination effects, as recited by claim 1.

6. Claim 17 is patentable over the combination of Thornton, Stanek, and JP 08-265413.

Claim 17 depends from claim 16.

None of the cited references disclose or suggest light sources that are semiconductor light emitting devices made of layered foil structures for dynamically illuminating individual keys or key groups of a keypad in such a way that the illumination means is reconfigurable for different kinds of illumination effects, as recited by claim 16.

7. Claim 18 is patentable over the combination of Thornton, Stanek, and JP 06-274261.

Claim 18 depends from claim 16.

Like the other references, the combination of Thornton, Stanek, and JP 06-274261 fails to disclose or suggest light sources that are semiconductor light emitting devices made of layered foil structures for dynamically illuminating individual keys or key groups of a keypad in such a way that the illumination means is reconfigurable for different kinds of illumination effects.

8. Claims 19 and 20 are patentable over the combination of Thornton, Stanek, and JP 11-88948.



Claims 19 and 20 depend from claim 16.

Like the other cited combinations of references, this combination fails to disclose or suggest light sources that are semiconductor light emitting devices made of layered foil structures for dynamically illuminating individual keys or key groups of a keypad in such a way that the illumination means is reconfigurable for different kinds of illumination effects, as recited by the independent claims of the present invention.

9. Claims 21-25 are patentable over Stanek.

Stanek fails to disclose or suggest a keypad for a mobile phone having a layer including a switching function and a layered foil illumination structure for each of the plurality of keys, integrated together, as recited by claim 21.

As mentioned above, in Stanek, the last sentence of column 8 tries to broaden the means for key illumination to include any means by stating that the scope of the patent is not limited to the disclosed examples, but can be used with many "changes and modifications," and may include "other manners of key illumination" without departing from the scope of the claims.

However, in light of Stanek, it would not have been obvious to substitute an OLED for a conventional LED because Stanek has no disclosure related to such a feature. The simple statement: "However, the invention could utilize other manners of key illumination without departing from the scope of the claims" is not enough to suggest Applicants invention as claimed.

Furthermore, the layered foil structures of the present invention and conventional LEDs are not functionally equivalent. As described in the present specification on page 3, line 33,

through page 4, line 9, and on page 10, lines 1-8, the layered foil structures have at least the following advantages: they may be placed close to the visible surface of illuminated keys, requiring only a fraction of the power used to drive conventional light sources; because they are thin, they allow the thickness of the keypad to be minimized; and, they may be produced together with other layers in a highly integrated structure. Thus, the layered foils structures are not equivalent to conventional LEDs. Use of layered foil structures is not an obvious design choice and has distinct advantages over the cited art.

Applicants further submit that, similar to the conclusion of obviousness reached above with respect to Thornton, that a conclusion of obviousness using Stanek is based on impermissible hindsight because it requires knowledge gleaned only from Applicants disclosure. There is no disclosure related to semiconductor light emitting devices made of layered foil structures in Stanek.

At least for these reasons, independent claim 21 and dependent claims 22-25 are patentable over Stanek.

10. Claims 26-28 are patentable over the combination of Stanek, Uggmark (US 6,222,466), and Thornton.

Claims 26-28 depend from claim 21.

The combination of Uggmark and Thornton fails to supply the feature missing from Stanek, a switching function and a layered foil illumination structure for each of the plurality of keys, integrated together, as recited by claim 21.

Therefore, the combination of Stanek, Uggmark, and Thornton fails to disclose all the features of claim 21 and fails to render claims 26-28 unpatentable.

11. Claim 29 is patentable over Stanek.


Stanek fails to disclose a mobile phone having a layer including a switching function and a layered foil illumination structure for each of a plurality of keys, integrated together.

Applicants submit that it would not have been obvious to substitute a layered foil structure for a conventional LED because Stanek has no disclosure related to such a structure. Applicants submit that the claimed layered foil structures and conventional LEDs are not functional equivalents because conventional LEDs have none of the advantages recited above. Further, the statement in column 8, lines 65-67 that the scope of the patent is not limited to the disclosed examples, but can be used with many "changes and modifications," and may include "other manners of key illumination" without departing from the scope of the claims, does not disclose or suggest the layered foil structures of the present invention. Still further, a conclusion of obviousness using Stanek is based on impermissible hindsight because it requires knowledge gleaned only from Applicants disclosure.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,

  
Joseph V. Gamberdell, Jr.  
Reg. No. 44,695


13 September 2004  
Date

Perman & Green, LLP  
425 Post Road  
Fairfield, CT 06824  
(203) 259-1800  
Customer No.: 2512

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